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Active flow control enables supersonic weapons release

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WRIGHT-PATTERSON AIR FORCE BASE, Ohio—Engineers in the Air Force Research Laboratory's Air Vehicles Directorate have successfully tested the safe, supersonic release of a 10% scale, 500-pound Joint Direct Attack Munition (JDAM) model from a rectangular bay using active flow control technology.

These long range strike aero experiments were conducted in cooperation with Boeing Phantom Works and performed at Boeing's polysonic wind tunnel in St. Louis, Mo. As a result of these experiments, deployed munitions showed a clear improvement of separation characteristics. Initial testing of JDAM models dropped from the bay resulted in the munition changing direction immediately and striking the bomb bay structure. Experiments conducted with active flow control consistently provided safe separation of deployed munitions across several different Mach numbers.

At supersonic speeds, the environmental conditions around an aircraft become dynamic and unpredictable. The shear layers and boundary layers that influence store separation at lower speed become highly erratic and can alter the trajectory of the store back towards the aircraft. Technology developed by the long range strike aero experiments focused on using active flow control to overcome the technical challenges associated with weapons integration/separation on a supersonic platform. @